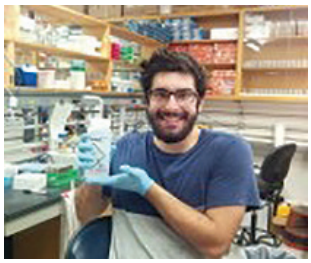
# BIOLOGYCURRENTS

2016 | THE QUEENS COLLEGE BIOLOGY ALUMNI NEWSLETTER | VOLUME 19, NO. 1

## Student Highlights

We are pleased to report some of what the Biology Department's amazing students have been doing and the honors earned.



*From left to right:* **Vincent Cali; Anna McPherran shown doing fieldwork on mongooses and wearing a tee shirt advertising her long-standing position at the New York Hall of Science; and Aaron Owen.**

**ELLIOT AGUILAR** (Lahti mentor) successfully defended his doctoral thesis "Models and Methods in Cultural and Social Evolution," and was awarded the PhD from the Doctoral Program in Biology–Subprogram in Ecology, Evolution, and Behavior of CUNY.

**MARKO BALOH** (Dennehy lab) was accepted into the Biology Doctoral Program at Texas A&M University. Marko joined Dr. Joseph Sorg's lab and is researching *Clostridium difficile* physiology and virulence with the end goal of developing novel antimicrobials to combat this pathogen.

**VINCENT CALI** (Dennehy lab) presented his research, "Effects of mutations in translational regulation of bacteriophage lambda S gene on bacterial lysis time," at the Annual Biomedical Research Conference for Minority Students (ABRCMS) meeting in Tampa, FL.

Doctoral student **JAMES CLARK** (Savage-Dunn mentor) was chosen for an oral presentation at the Northeast Regional Society for Developmental Biology meeting at Marine Biology Laboratory in Woods Hole, MA.

**GIULIETTA COPPOLA** and **AMANDA GOLDSTEIN,** undergraduates in the Lahti lab, presented at the CUNY Service Corps Poster Session describing their work at the Queens Zoo, "Wildlife Conservation Society City Zoos: Queens Zoo."

**DAYSE DA CUNHA** (co-mentored by Alicia Meléndez and Hannes Buelow of Albert Einstein Medical School) presented her doctoral thesis research, "Distinct heparan sulfate modification patterns control germline stem cell proliferation," at the Universidade Federal de São Paolo, São Paolo, Brazil.

**LAUREN ESPOSITO** (Dennehy lab) received a master of arts degree in Biology from QC and is now in the master of public health program at Mount Sinai College of Medicine. She is also employed as a Health Research Training Program Intern for the Zoonotic, Influenza and Vector-Borne Disease Unit of the Bureau of Communicable Disease at the New York City Department of Health and Mental Hygiene.

**NATASZA FONTAINE**, a master's student in the Lahti lab, had a photograph used for the September cover of *Saving Land,* a publication of the Land Trust Alliance.

**FRANNY GELLER** (Lahti mentor) presented at the CUNY Evolution, Ecology, Behavior symposium at the Graduate Center on "Cultural evolution and function in the house finch."

**SANDY (HARSANGEET) GILL**, an undergraduate in the Lahti lab, was awarded Queens College's Kenneth Kupferberg Memorial Scholarship for students majoring in the natural sciences with an outstanding academic record.

**ARYEH GOLD** (Meléndez lab) presented his research at the annual Undergraduate Thesis in Neuroscience presentations. His thesis was entitled, "Crosstalk between endocytosis and autophagy: ATG-9 localizes to late endosomes."

**JONATHAN GOODMAN** (Lahti lab) published two pieces in *Aeon:* "If culture is too expensive for most, everyone pays a price" and "How statistics are twisted to obscure public understanding."

**UDAY MADAAN** (Savage-Dunn mentor) was awarded a CUNY Graduate Center Dissertation Year Fellowship.

**CHARLES MANIEGO** (Lahti lab) presented his undergraduate honors research at the Sigma Xi Research Day at Queens College: "Cultural variation in house finch (*Haemorhous mexicanus*) song."

**ANNA McPHERRAN**, a Queens College undergraduate scholar in the William E. Macaulay Honors College and researcher in the Lahti lab, had an exceptional senior year. She defended her honors thesis, "Possible effects of anthropogenic noise and land use on house finch songs in California." She received the Biology Department's Muriel and Philip Feigelson Award that recognizes "outstanding achievement in research." Anna was a recipient of the Queens College Kenneth Kupferberg Memorial Scholarship, which is awarded to high-achieving students in the Division of Mathematics and Natural Sciences. She graduated with high honors in Biology and is a member of the Phi Beta Kappa Society. As if that were not enough, Anna received the Top of the Ladder Award from the New York Hall of Science, where she had volunteered since 2013 as a Design Lab Experience Coordinator, Program Explainer, and Explainer Intern. What an incredible young woman!

**AARON OWEN** (Lahti mentor) gave invited talks at both Yale University and Fordham University, speaking on his doctoral thesis research, "Rapid evolution by sexual selection following introduction in the small Indian mongoose."

**NICHOLAS PALMISANO** (Meléndez lab) spoke on his doctoral thesis research, "The small GTPase, RAB-10, is required for autophagy in *C. elegans*" at the New York Graduate Student Symposium on Cell and Cancer Biology, Memorial Sloan Kettering Cancer Center. He also spoke at the CUNY Worm Talks held at Brooklyn College on "RAB-10 acts in autophagy flux" and at

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the CUNY-wide *C. elegans* Meeting at City College on "The GTPase, RAB-10, regulates the dynamics of autophagy."

**ELSA ROSARIO** (Dennehy lab) presented her research, "Determining function of two unidentified ORFs in bacteriophage φ6," at the Annual Biomedical Research Conference for Minority Students (ABRCMS) meeting in Tampa, FL.

**NATALIE ROSARIO** and **MATEUSZ WYSOCKI**—both undergraduates working in the Meléndez lab—presented a poster at the Mount Sinai Undergraduate Symposium on "The role of RAB-10 and RME-1 in *C. elegans* autophagy."

Undergraduate **MIN KYUNG SHIN** (Savage-Dunn lab) was awarded a Kenneth Kupferberg Memorial Scholarship to fund her summer research.

**MELISSA SILVESTRINI** (Meléndez lab) spoke on her doctoral thesis research, "Autophagy deficiency triggers cytosolic lipolysis via adipose triglyceride lipase-1 in a PKA-dependent manner," at the CUNY-wide *C. elegans* meeting held at City College.

**CARMEN URGILES** (Dennehy lab) presented her research, "Does cell growth rate affect event timing in *Escherichia coli*?" at the Annual Biomedical Research Conference for Minority Students (ABRCMS) meeting in Tampa, FL.

**NINA UZOIGWE**, a high school student working in Dr. Meléndez's lab in collaboration with her doctoral students, presented a poster at Stuyvesant High School's 1st Annual Research Night on "Endocytosis aids lipophagy, paving the way for therapeutic interventions against human metabolic disorders and cardiovascular diseases."

## Letter from the Editor

Corinne A. Michels

*Biology Currents* 2016 is published! Putting together this issue was especially enjoyable because so many of the articles highlight alumni both old and newly minted. If you are receiving *Biology Currents* for the first time, we welcome you to the Biology Department's alumni newsletter. To continue to receive *Biology Currents* in the years to come, please keep your information up to date with the Alumni Office.

*Biology Currents* applauds the accomplishments of the Biology Department community: students, faculty, and alumni. This is particularly true in this issue. The **STUDENT HIGHLIGHTS** section singles out a few of the department's current students whose achievements are impressive. Additional examples of their work can be found in the **FACULTY SCHOLARSHIP** section that indicates which authors were Biology Department students. It is not unusual to see undergraduates listed as authors of a research article in a peer-reviewed journal. Even more often, students present their research at scientific conferences' poster sessions (see **FACULTY NOTES** section). A number of these venues are for undergraduate researchers, especially minority students, and our students are consistently active participants. Faculty grants and alumni funds support undergraduate travel to conference venues.

**Dr. Bernard Salick '60** spoke on "Entrepreneurial innovations in healthcare services" as part of the college's Professionals on Campus program. Dr. Salick is a nationally and internationally recognized pioneer in the development of outpatient healthcare centers for the treatment and maintenance of chronic diseases. His presentation attracted collegewide attendance. Our article expands on Dr. Salick's career, describing how he transitioned from a physician specializing in kidney disease to the CEO of Salick Health Care to an outspoken advocate for innovative programs in healthcare delivery. To accomplish this, he brought together the members of the medical community, the business community, and academia.

We also draw your attention to the **ALUMNI UPDATE** section, which includes write-ups on five alums going back to the class of 1961! It was a pleasure to receive their emailed messages and to engage in back-and-forth conversations that expanded on their comments and obtained photos. I hope you enjoy reading these updates and give serious consideration to sending us your story.

Anyone inspired to contribute to the department's Alumni Fund is encouraged to do so at any time during the year, not just during the college's fall fundraising drive.

Here's how:

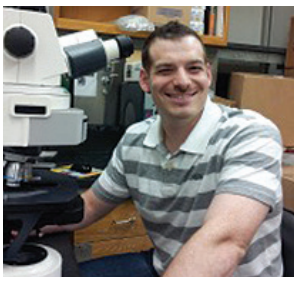
BY MAIL: Make your check payable to **Queens College Foundation** and write "**Biology Department**" in the memo line. Send to: Queens College Foundation, Kiely Hall 906, 65-30 Kissena Boulevard, Queens, NY 11367-1597.

ONLINE: Use the link (https://qccommunity.qc.cuny.edu/QueensCollege/DonateNow). In the section labeled "Donation Information," use the pull-down menu under the title "Designation" and select "Other." A new line will open in which you can enter "Biology Department." The link is a fast and secure method of donating.

Either way, you will receive a letter from the foundation acknowledging your donation, which is tax deductible.

Thank you for your support.

Regards,
Dr. Corinne A. Michels '63
Distinguished Professor Emerita



**Nicholas Palmisano at his microscope.**

**Dr. Savage-Dunn and students James Clark,[D] Gehan Ranepura,[U] Uday Madaan,[D] and Michael Meade[M] enjoying some time off.**

# *DR. BERNARD SALICK SPEAKS ON "ENTREPRENEURIAL INNOVATIONS IN HEALTHCARE SERVICES"*

**DR. BERNARD SALICK**

In September the college was extremely pleased to welcome one of our most renowned graduates to campus, Dr. Bernard Salick. His talk, which attracted a collegewide audience, was presented in the Professionals on Campus program. Dr. Salick is widely recognized as a visionary pioneer who has had a major impact nationally and internationally in the development of new clinical programs for the diagnosis and treatment of patients in many areas of medicine, including end-stage renal disease (ESRD), cancer, organ transplant, cardiovascular disease, AIDS, and personalized medicine. His lecture, based on his personal history and his practice of medicine, focused on how enlightened partnerships between the medical community and the private sector can bring novel ideas to the treatment and maintenance of patients suffering from serious and catastrophic illnesses. Additionally, he discussed health insurance mechanisms designed to help people cover the costs of catastrophic care, an area quite relevant to patient care in today's world.

Dr. Salick received his BS degree from Queens College in 1960 and his MD from the University of Southern California in 1964. He completed his internship and residency in internal medicine at Cedars–Sinai Medical Center (CSMC), and completed a National Institutes of Health Postdoctoral Fellowship in nephrology at CSMC in Los Angeles and the University of California, Los Angeles. Following this extensive training, Dr. Salick established a practice in Beverly Hills, specializing in kidney disease. His entrepreneurial spirit emerged in 1972 when he invested his personal funds in a chain of kidney dialysis centers. He decided to keep the centers open 24 hours per day, seven days per week, for the convenience of patients and their families. The concept was extremely successful, and a public healthcare company bought the dialysis business, although he continued to be involved in its management. By 1983 and with private backing, Dr. Salick took back control of the dialysis centers. He founded Salick Health Care, Inc., and was soon awarded a contract from CSMC to operate their acute and chronic dialysis programs.

A family medical crisis intervened when Dr. Salick's six-year-old daughter was diagnosed with an aggressive and deadly bone cancer, osteogenic sarcoma. Dr. Salick put his medical practice on hold, and he and his wife, Gloria, were intensely involved with the care and treatment of their daughter. She had her initial chemotherapy at a Los Angeles hospital, under the direct supervision and input from a world-renowned expert at Memorial Sloan Kettering Cancer Center, Dr. Gerald Rosen. Chemotherapy was followed by surgery. Dr. Salick's daughter recovered, but the traumatic experience of providing her round-the-clock care left a profound emotional mark on the Salick family. There were midnight trips to emergency rooms, and nights sleeping in hospital hallways because no provisions for the patient's family were available in the hospital. With this experience in mind, Dr. Salick set about to expand his business to include comprehensive cancer care, providing diagnosis and treatment that would be available 24/7 in an environment supporting the needs of both the patient and the family.

The first in a series of outpatient cancer centers run by Salick Health Care, Inc. (a publicly held company) opened at CSMC in 1985. This business model continued as the number of centers expanded. The cancer centers partnered with academic nonprofit hospitals, using their outstanding medical staff and providing the extensive outpatient care available at the Salick Health Care centers. Drawing from the family's personal experience, Dr. Salick made certain that the center's architectural design was outstanding, and that the surroundings were cheerful and comfortable. Valet parking, meals, and psychosocial services were provided at no cost to the patient. Every effort was made to ease the heavy burden placed on the patient and the family by this devastating illness.

As part of this effort, Dr. Salick created a managed-care subsidiary, the first ever to offer fixed-price insurance products for the treatment of catastrophic diseases such as cancer and ESRD. He established a series of practice guidelines and outcome measurements for the treatment of cancer patients that were instituted nationwide at the eleven Comprehensive Cancer Centers and the eight Comprehensive Breast Cancer Centers operated by Salick Health Care, Inc.

In 1997 Dr. Salick sold Salick Health Care, Inc. to Astra-Zeneca, but continued to advance healthcare management through innovative and unique solutions to patients, physicians, and insurance providers with quality care and cost-effective, disease-specific programs. Based on the disease-specific paradigm that he had previously pioneered, in 2006 Dr. Salick announced the formation of Salick Comprehensive Cardiovascular Centers, Inc., which would provide a broad range of state-of-the-art procedures and techniques for the treatment and diagnosis of cardiovascular disease on an outpatient basis. The centers would be available 24/7 to provide high-quality, user-friendly patient care in a cost-efficient environment. According to Dr. Salick, "One in four Americans today has some form of cardiovascular disease, and the numbers are increasing. Among the significant

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# ALUMNI UPDATE 2016

We are very excited to include updates on five Biology alumni in our 2016 issue. All contacted the editor-in-chief, Dr. Michels, via email (Corinne.Michels@qc.cuny.edu) and sent the paragraphs below. If you enjoy reading these, we heartily encourage you to do the same. Put "Biology alum" in the subject line, indicate the year you graduated, and write a paragraph updating your fellow alums on your personal and professional life. Be brief, or not—your choice. If you have a photo you would like to include, please send it as a jpeg attachment. We will not publish your email address, but anyone interested in getting in touch with an alum who appears in Alumni Update should contact Dr. Michels by email, as above. She will forward your message as appropriate.

### DR. HARRIS TAYLOR, MD '61

I retired completely from medical practice in June 2013 as Clinical Professor of Medicine in the Division of Clinical and Molecular Endocrinology at the Case Western Reserve University School of Medicine. Unfortunately, my wife, Diana '62, died this past June 13.

After graduating Phi Beta Kappa from Queens in 1961, I spent the next four years at the University of Chicago School of Medicine, and then a fifth year as a straight medical intern at the University of Chicago Hospitals. After marrying in 1962, Diana joined me and the mathematics department at the University of Chicago, where she received her PhD in 1966 at just the same time I completed my internship. We then joined the Peace Corps, where I served as a staff physician for two years and Diana taught on the mathematics faculty at the Universidad del Valle in Cali, Colombia.

On returning to the states in 1968, we had our son Brian and daughter Rebecca in pretty rapid succession while I began my residency and chief residency at Cleveland Metropolitan General Hospital and Case Western Reserve University, followed by an endocrinology fellowship at the Cleveland Clinic. This was followed by a long association with Lutheran Medical Center and Fairview General Hospital, now part of the Cleveland Clinic Health System. While there, I began my private practice of endocrinology, established the Endocrinology-Radioimmunoassay Laboratory, and actively taught in the Internal Medicine Residency program. I subsequently directed the program from 1985 to 1994.

**DRS. HARRIS AND DIANA TAYLOR**

During this time and later, I had the good fortune to carry on a program of clinical research, resulting ultimately in the authorship or co-authorship of some four dozen peer-reviewed papers with over 1,100 citations, as well as five chapters. In 2003 I closed my private practice and moved to the CWRU Medical School and the Cleveland VA hospital, where I continued to teach and serve as the site's principal investigator on the NIH-sponsored ACCORD study. This landmark investigation, involving multiple institutions in the U.S. and Canada, demonstrated conclusively that tight glucose control in patients with Type-2 diabetes mellitus and coronary artery disease failed

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### *DR. SALICK*

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factors influencing this are skyrocketing rates of Type II diabetes and obesity as well as an aging population." This program would be merged into his Salick Comprehensive Diabetes Centers, Inc.

In 2010 Harvard University's Joslin Diabetes Center and its Board of Trustees offered Dr. Salick the position of Chief Executive Officer of the Joslin Diabetes Clinic. Although he declined the offer, he began to plan a nationwide program of Comprehensive Diabetes Centers using his approach to comprehensive disease management. He has been intensively involved in developing these centers with academic medical centers and governmental agencies throughout the United States, the United Kingdom, Europe, Israel, Southeast Asia, and China. In addition, Dr. Salick worked with members of the Harvard Business School and Harvard Medical School faculty to develop plans for a Personalized Medicine, Molecular Biology entity led by Dr. Raju Kucherlapati, head of Genetics at Harvard Medical School.

Dr. Salick's service to the education and medical communities is varied and extensive. He served on the Board of Trustees of the Queens College Foundation and Crossroads School for Arts and Sciences in Santa Monica, and has been a member of the Visiting Committee and the Leadership Council of the Harvard School of Public Health. He is a regular visiting lecturer, and is a member of the Healthcare Initiative Advisory Board and the Centennial Committee of the Harvard Business School. In 2004 Dr. Salick established a fellowship at the Harvard School of Public Health to provide annual scholarships for selected students pursuing studies related to cancer and/or cardiovascular disease. Dr. Salick served on the Harvard Business School panels for Healthcare Innovation and Opportunities in Southeast Asia and, in 2005, was a guest speaker at the Harvard Business School for the India and Its Neighbors Conference. He served on the Board of Directors of Nephros, Inc. from 2005 to 2007, and was a member of the Board of Trustees for the United States Equestrian Team Foundation from 1991 to 2011. Dr. Salick has provided funds for fellowships and scholarships at Yeshiva University, Harvard School of Public Health, Queens College, and Stuyvesant High School.

Dr. Salick and his wife reside in Los Angeles and New York. They have three daughters, who have each completed graduate and post-graduate school in New York and Washington, DC. Dr. Salick and Mrs. Salick presently have five grandchildren and are expecting their sixth grandchild soon.

to improve the cardiovascular outcomes in the patients studied.

Since the untimely death of Diana, I continue to attend various medical conferences at CWRU as well as a host of other cultural and intellectual activities. Perhaps the best, however, is the time I spend with my children and grandchildren. Indeed, there is life after medicine.

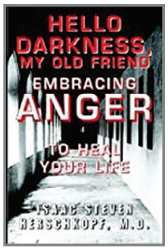
### DR. ISAAC STEVEN HERSCHKOPF, MD '71

In view of the fact that I just celebrated my 39th birthday (okay, for the 28th time), I find it hard to believe that it has been a half-century since I entered Queens College.

Thank God I graduated Phi Beta Kappa because it was at the height of the Vietnam War, and I was therefore able to gain acceptance to several outstanding medical schools. I had never lived away from home and went to NYU because Bellevue was its teaching hospital. I had little time for extracurricular activities at Queens College, but I made up for it in medical school. I graduated valedictorian, president of my class, editor of the yearbook, and captain of the basketball team. I was selected to be valedictorian of the entire university and spoke at the university graduation in Madison Square Garden. It was the only way I would ever get to play the Garden.

I skipped my internship, trained in psychiatry at Mount Sinai Hospital in New York, and returned to NYU, where I have remained on the faculty ever since. I have received several awards, including the Alpha Omega Alpha Honor Medical Society Great Teacher Award. I have served as president of the medical school alumni as well as chairman of the medical school's sesquicentennial. I am the founding president of the NYU Bellevue Psychiatric Alumni Association and remain in that position.

I have maintained a full-time private practice in psychiatry since 1978, in addition to consulting with businesses, writers, directors, actors, movie studios, professional athletic teams, and the Secret Service. I'm a regular columnist for some local newspapers and have been published in medical, news, and literary periodicals. My book *Hello Darkness, My Old Friend: Embracing Anger to Heal Your Life* continues to sell well and is frequently cited.




My wife and I are celebrating our 40th anniversary and are incredibly proud of our three daughters. Our eldest followed me into psychiatry, won the Prite Fellowship as one of the top two psychiatric residents in the country, and currently works at Harvard, where she had gone to medical school. Prior to that she earned a master's degree at the Queen's College of Oxford. She maintains, implausibly, that she was accepted there because she had graduated valedictorian from Yale. I explained to her that she only was accepted as a legacy because I had graduated from Queens College.

Several years ago I was cited in a *New York Times* article, together with Jerry Seinfeld, Simon and Garfunkel, and Marvin Hamlisch, as well-known Queens College alumni. I, however, was the only one to refer to our alma mater as "The Harvard of Flushing."

### DR. LON S. KAUFMAN '77 and ZENA GOLD KAUFMAN '77

Lon and Zena met in Invertebrate Zoology! Both graduated in 1977 and married in 1978.

Lon joined Hunter College in July 2015 as the Acting Provost and Vice President for Academic Affairs. He attended Stuyvesant High School and Brooklyn College, but graduated from Queens College with a BA in Biology. Lon earned a PhD in Cell and Developmental Biology from SUNY, Stony Brook. Prior to Hunter College, Lon was a member of the faculty at the University of Illinois, Chicago (UIC) for 30 years, serving as an assistant, associate, and full professor in the Department of Biological Sciences.

In 1994 he was named the Richard G. and Carole J. Cline University Scholar. In addition to his scholarship, Lon also served in a variety of administrative positions, including Vice Chancellor for Academic Affairs and Provost, Vice Provost for Planning and Programs, Vice Provost for Undergraduate Affairs, Dean of the Honors College, and Head of the Department of Biological Sciences. Lon led the team that was responsible for the development and launch of UIC College Prep, arguably the most successful open-enrollment public charter school in Chicago. He continues his deep commitment to public urban education at Hunter College.

Zena is the Vice President of Quality at Roivant Sciences. In this role she leads the Corporate Quality function over the life-cycle of the business. Roivant delivers R&D solutions to the biopharmaceutical industry and academic institutions through partnerships designed to realize the full potential of promising biomedical research. Prior to joining Roivant, Zena was President of ZGK Quality Consulting, working on a variety of quality and compliance projects.

Prior to that, she was the Senior Vice President of Quality at Hospira Inc., a leading pharmaceutical and device manufacturer of sterile injectable products and medical devices. She joined Hospira from Abbott, where she was Divisional Vice President of Quality Systems in Global Pharmaceutical Operations.

While at Abbott, Zena had the honor of participating in the Expert Working Group on ICH Q10, Pharma-ceutical Quality Systems, was chair of the Technical Leadership Committee at PhRMA, and served on the board of the Parenteral Drug Association.

Zena received a BS degree in Biology from Queens College and an MS in Marine Environmental Sciences from the State University of New York at Stony Brook. She lives in Manhattan with her husband, and often can be seen running the loop at Central Park.

### LINDA HALPERN '86

I graduated with a major in Biology and a minor in Philosophy, and remember having Dr. Michels for the Genetics Laboratory class, which I enjoyed. I can still remember those giant red *Drosophila* compound eyes staring back at me through the microscope! I received an MLS from Queens College in 2003, and have been working for the past 17 years as a librarian for Queens Library.

Thanks to you, to the Biology Department, and to CUNY for providing me with an outstanding education at such a reasonable cost.

## *Biology Alumni Fund Provides Sweatshirts to the Biology Honor Society*

Biology Honor Society sporting their sweatshirts. Starting from the top left to right: Joshua Yaminian, Nathaniel Schwartz, Dov Bitterman, Ari Bitterman, David Lee Bitterman, Professor Dr. John Dennehy.

On the bottom, from left to right: Freda Ishakova, Elizabeth Yakubova, Leora Margolovitch, Ben Musheyev, Yakubmier Borukhov, Mordechai Sternman.

This year the Biology Honor Society stepped up its game. With support from the Biology Alumni Fund, society members were able to design and purchase sweatshirts that they use to advertise and popularize the society's tutoring program. Members are now "walking billboards," making it far easier for students in need of academic assistance to identify providers.

For years the members have been providing free tutoring to students taking Biology Department courses, especially Introductory Biology. Their service takes place in the form of recitations for biology classes and individualized tutoring. The department supports the society's tutoring activities by providing a large office space in Colwin Hall— outfitted with computers, texts, microscopes, and other supplies—exclusively for their use.

Josh Yaminian, current secretary of the Biology Honor Society, feels that the sweatshirts make other students "more comfortable to ask us questions." Because of the sweatshirts, "students recognize us and [feel more free] to ask us questions even outside of recitation." Josh loves teaching and gets a great deal of satisfaction from tutoring. "When students understand my explanations behind complicated ideas, I feel that the time I put in is all worth it."

With Prof. John Dennehy at the helm, the society is moving to formalize tutoring agreements with the college's Academic Advising Office and to coordinate with a U.S. Department of Education grant received by Queens College. The goal of the award is to improve graduation rates in STEM fields by improving student performance in "bottleneck" courses such as Biology 105 and Chemistry 113: the first semester of science major-level Introductory Biology and Introductory Chemistry, respectively. Part of the plan is to hire peer tutors for students at risk, and the Biology Honor Society will be a vital source of highly qualified tutors. Society members are also considering becoming a chapter of TriBeta, a national biological honor society.

## FACULTY IN THE NEWS 2016

**PROF. DAVID LAHTI** wrote a letter to the editor of the magazine *Inference: International Review of Science*, entitled "An ambivalent amphibian." Dr. Lahti's letter was in response to an article by Bret Weinstein, "On Being a Fish," discussing taxonomic classification of organisms based on evolutionary "relationship" to other organisms. Dr. Lahti makes several points in his article, as follows. "We run into this problem in any pursuit of naming and grouping things in ignorance of their causes. We don't know the causes of most mental disorders and conditions, for instance, and so we name them for their symptoms instead. If we knew the causes, we would have an empirical basis on which to construct a real psychiatric taxonomy. Likewise, now that we know what process actually causes new living things—evolution—we have a solid basis for naming and grouping organisms."

Dr. Lahti's article (see **FACULTY SCHOLARSHIP**) in *American Naturalist* on why birds lay blue eggs, entitled "Shedding light on bird egg color: pigment as parasol and the dark car effect," was featured in several media outlets, including the BBC, *Forbes, Science Daily, Science News,* and Cornell University's *All About Birds.*

David Lahti and Cesar Castillo doing fieldwork on Long Island Sound's beaches.

**JOAN GRALLA**, reporter for *Long Island Newsday*, interviewed **Professor Emeritus Andrew Greller** for her article entitled "Controlled burn aims to protect rare wildflower," which appeared on October 30, 2016. Dr. Greller is considered the "go-to" authority by local press on all things native plant and forest related.

**DR. ESTHER MUEHLBAUER** participated in the Tidal Exchange Jamaica Bay: Crossroads of Resilience Bike Tour in September 2016. This was the second Tidal Exchanges biking tour, hosted by the NY–NJ Harbor & Estuary Program and the Science and Resiliency Institute @Jamaica Bay. The goal was to highlight "the unique challenges of and solutions for an area in which rich habitat and communities lie adjacent to each other in an area vulnerable to sea level rise and coastal storms." The bike tour started at a meeting point in Howard Beach and continued through Broad Channel along Cross Bay Boulevard to Rockaway Beach, with stops at West Pond Breach, Sunset Cove Park, and Spring Creek, ending at the Rockaway Brewing Company. Representatives of several environmental societies and NYC commissions gave presentations at each of the rest stops. The long-term goal is the restoration of the Jamaica Bay tidal estuary.

## *Dean Martin G. Klotz – Leaving Queens College*

by Uldis Roze

Dean Martin G. Klotz

When Martin G. Klotz arrived at Queens College in fall 2015 as Professor of Biology and Dean of Mathematics and Natural Sciences, the 2015 issue of *Biology Currents* promised a fuller article in the following issue. Unfortunately, this article must also serve as a farewell. After two years at Queens College, Dean Klotz is moving to Washington State University Tri-Cities to become the Vice Chancellor for Academic Affairs while serving as Professor of Microbiology at Washington State's School of Molecular Biosciences. Dean Klotz gives the reasons for moving as medical: "a healthy wife is a happy life."

Martin recalls his scientific career starting on the rug of his father's study in the East German city of Jena. Both his parents were biologists, and they owned the complete 30-volume set of the *Encyclopedia Brockhaus*. Once young Martin had become engrossed in a story of science or the natural world, the evening was spoken for.

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Martin's father was also the director of the Jena Botanical Garden (where Goethe had studied botany and written a number of his poems) and keeper of its extensive herbarium. The family was able to travel widely, exploring the mountains, forests, and natural areas on the east side of the Iron Curtain.

Martin earned his BS from the University of Rostock (1980), graduating with the highest honors and a federal scholarship to the University of Jena. Though growing up in a biological environment, he had majored in physics, the science that underlies all others.

At the University of Jena, Martin earned an MS in Biophysics (1982) and a PhD in Biology (1986). For his thesis project, he studied the transport of fungal secondary metabolites across artificial membranes.

The student years were followed by a series of widely scattered postdoc positions. At the Hungarian Academy of Sciences in Szeged, he studied transport processes in plants, and published ten papers on the topic. Though Hungary in 1986–1987 still found itself behind the Iron Curtain, the language of communication was English. The postdoctoral year at Szeged was followed by several returns to collaborate at the bench with his Hungarian colleagues as well as three months at the University of Lund, Sweden (1988), where Martin learned the techniques for isolation and handling of subcellular organelles.

The American years began in 1989, as Visiting Assistant Professor at the Department of Plant Pathology at the University of Missouri, Columbia. In 1990–1991 he was a Faculty Research Associate at the University of Maryland–College Park. From 1991 to 1995 he worked at the Department of Biology, Utah State University, in a research position funded by his NSF grant, and from 1995 to 1998 he served as Assistant Professor at the University of Colorado, Denver. From 1998 to 2011 he rose through the ranks to Professor at the Department of Biology, University of Louisville, Kentucky. There he was also active as a university senator, a foretaste of his later involvement in faculty governance. From 2011 to 2015 he served as Director of the Biology PhD Program at the University of North Carolina–Charlotte, and Professor and Chair of the department.

To date, Martin has generated some 105 scientific papers, books, and patents, which Google Scholar credits with 6,039 citations in the scientific literature. Typically, an article citation rate of 20 to 50 indicates a significant contribution. His research focus over the past twenty years has been the nitrogen cycle. (For an overview, see L.Y. Stein and M.G. Klotz 2016, The Nitrogen Cycle. *Current Biology* 26: R94-98.)

Respiratory ammonification of nitrogen oxides (NOx) as well as nitrogen fixation ($N^2$ ->$NH_3$) are key steps of the cycle that provides the most reduced form of nitrogen, ammonium, which is needed to form amino acids and nucleotides, the building blocks of proteins and nucleic acids, respectively, and other small molecules of life. While historically speaking, nearly all fixation of nitrogen into the biosphere was accomplished by bacteria and archaea, today it is the Haber-Bosch process that generates the reduced nitrogen needed to feed an estimated 48 percent of the human population. With continued population growth and heavy fertilizer use, the global nitrogen cycle is out of control. $NO_3$ pollution is creating dead zones in lakes and coastal areas, and $N_2O$ is on track to become a key greenhouse gas of the 21st century.

Yet scientists are still in the process of discovering how the intricate microbial processes of the nitrogen cycle work. It appears that the intermediates of the nitrogen cycle don't necessarily follow the cyclic path described in texts of general biology, but form a web with transformations mediated by microorganisms whose genomes encode cassettes of the required protein machinery. Martin describes it as the Nitrification Network, and he is the founder and member of the steering committee of an organization established to coordinate research in the area (Nitrificationnetwork.org)

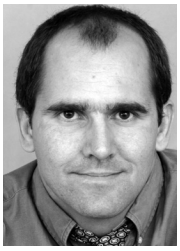
In addition, since 2010 he has been editor-in-chief of *Frontiers in Microbiology,* a periodical with a growing and enviable three-year citation rate of 4.2 per article. He also sits on the editorial boards of *Applied and Environmental Microbiology* and *Environmental Microbiology,* and is the co-editor of *Nitrification*.

Since finishing his PhD thirty years ago, Martin has moved nine times, living in four language zones on two continents. Is there something constant that he carries with him? Indeed there is. To his new home, he is carrying a packet of seeds of the common garden hollyhock. But these are seeds derived from plants tended by Martin Luther at Wittenberg, a location not far from Jena. He is also carrying his scientific horizon, which sees the world as an interlinking of biological networks invisible to the eye but essential to the web of life. We wish him success in his new scientific home.

# FACULTY NOTES 2016

This section reviews the highlights of Biology Department faculty members and staff, and students' extracurricular scholarly activities in 2016. The diversity of these activities is a clear indication of the national and international recognition of our dedicated faculty. You should note the extent to which undergraduate students are integrated into their research programs.

**JOHN DENNEHY** spoke at the



European Conference for Mathematical and Theoretical Biology in Nottingham, UK, on research carried on with University of Delaware doctoral students Khem Ghusinga, Cesar Vargas, and Associate Professor Abhyudai Singh entitled, "First-passage time approach to modeling timing phenomena in single cells." He also presented a poster on "The benefits of sticking together: cellular aggregation and fitness in *Pseudomonas pseudoalcaligenes*" at the Sigma Xi Scientific Research Society Annual Meeting, Atlanta, GA, with doctoral students Emily Lin, Brian Ford, Amanda Larracuente, Glennon Bythroe, undergraduate students Marko Baloh and David Toubiyan, and Hunter College CUNY Professor Weigang Qiu.

Dr. Dennehy was invited to speak at the CUNY Research in the Classroom Workshop held at John Jay College, CUNY. His talk was entitled, "Assessing impacts of integrating research experiences into the curricula." He also spoke at the Department of Biology, Lehman College, CUNY on "Event timing in single cells." Dr. Dennehy presented his research on "Codon usage bias and bacteriophage genomics" at the American Chemical Society Middle Atlantic Annual Meeting.

**KARL FATH** was invited to speak at LaGuardia Community College's Biology Department about his research on the "Use of nanotechnology in drug delivery and tissue formation."

**ANDREW GRELLER** presented a talk

on "Mayan natural history in Belize" to the membership of the Long Island Botanical Society, Muttontown Preserve, Nassau Co., NY. He also spoke on the "Birds of Taiwan" to the membership of the Queens County Bird Club, Douglaston, NY.

Dr. Greller led a field trip at the Alley Pond Environmental Center, Douglaston, NY, on the "Flora and vegetation of Alley Pond Park." The trip was a three-hour tour of the forested uplands of Alley Pond Park designed for Field Biology Interns (high school).

**NATHALIA HOLTZMAN** was invited

to speak in the Biology Seminar Series of Manhattan College, NY. Her topic was "How cardiac contractions shape the heart."

Dr. Holtzman was an author of a poster presented at the Biophysical Society's 61st Annual Meeting held in New Orleans, LA, entitled "A gain-of-function TRPP2 ion channel created by mutating single amino acid in the S5 transmembrane domain." With doctoral student Corinna Singleman, Dr. Holtzman did poster presentations on "Using zebrafish to model toxin-induced cardiac defects in Atlantic sturgeon and exploring a novel mechanism of AhR function in PCB exposed fish" at the Society for Environmental Toxicology and Chemistry North America Annual Conference in Orlando, FL, and on "Understanding how PCB toxins cause heart defects early in fish development" at the Northeast Regional Society for Developmental Biology Conference in Woods Hole, MA.

**DAVID LAHTI** spoke at Oxford

University, Lady Margaret Hall, Oxford, UK, on "Can moral values survive evolutionary analysis?" He was also invited to speak in the Department of Biology seminar series of Fordham University, NY. His topic was the "Interplay of nature and nurture in the evolution of bird song." Dr. Lahti gave invited lectures in the Cambridge University, Faraday Institute Summer Course, Cambridge, UK, and participated in the panel discussions that followed. His topics were "Evolution and moral freedom" and "Biology and personhood."

Dr. Lahti was awarded a John Templeton Foundation Grant: "Towards a new synthesis for cultural evolution." He also received a small grant from Wildlife Acoustics to study sunbirds in West Africa. Dr. Lahti served on an NSF panel for Graduate Research Fellowships. He was also elected to the Board of Directors of Thinking Animals United.

**ALICIA MELÉNDEZ** was invited to

speak on her research on "Autophagy in *C. elegans* development and aging" at the II UNIFESP International Worm Meeting, Universidade Federal de São Paolo, São Paulo, Brazil, and at the Keystone Symposia on Autophagy: Molecular and Physiological Mechanisms held in Whistler, British Columbia, Canada. She also gave a talk at St. John's University's Department of Biology's seminar series on "Autophagy in *C. elegans*."

Dr. Meléndez presented research on "Non-autonomous BEC-1/Beclin1-mediated autophagy is required for the G2/M transition during germline proliferation in *C. elegans*" at the New

York Area Worm Meeting in January. The work was carried out by doctoral students Kristina Ames and Dayse DaCunha; undergraduate students Brenda Gonzalez, Feng Lin, and Sara Wong; and in collaboration with Dr. Hannes Buelow of Albert Einstein College of Medicine. This work was also presented as a poster by the same authors at the Germ Cell CSHL Meeting, held at Cold Spring Harbor Labs, NY. Dr. Meléndez, doctoral student Nicholas Palmisano, and undergraduate students Natalie Rosario and Mateusz Wysocki presented a poster on their research entitled, "The recycling endosome protein RAB-10 promotes autophagic flux in *C. elegans*" at the American Society of Cell Biology Annual Meeting held in San Francisco, CA. This work was done in collaboration with Dr. Barth Grant of Rutgers University.

Dr. Meléndez was awarded a three-year National Institutes of Health AREA grant entitled, "Role of autophagy and retromer genes in GLP-1/Notch signaling."

She also served on an NIH Special Emphasis Panel grant review panel.

**CORINNE MICHELS** reviewed (with publisher's credit) the first edition of *Molecular Biology: Structure and Dynamics of Genomes and Proteomes* by Jordanka Zlatanova and Kensal E. van Holde, published by Garland Science, New York, 2016. Pp. 624. (ISBN: 978-0-8153-4504-6)

**ESTHER MUEHLBAUER**'s recently published book *Plato to Darwin to DNA: A Brief History* was reprinted with revisions. ISBN: 978-1-5249-0820-1

**CATHY SAVAGE-DUNN** attended the Northeast Regional Meeting of the Society for Developmental Biology, Woods Hole, MA, where her work with doctoral student James Clark on "The interplay of DBL-1/BMP and DAF-2/Insulin signaling in *C. elegans*" was presented. Dr. Savage-Dunn presented at the 11th International Bone Morphogenic Protein (BMP) Conference in Boston, MA, on "Regulation of fat accumulation by DBL-1/BMP signaling in *C. elegans*." She also attended the Allied Genetics Conference in Orlando, FL, where she gave a poster on her research with doctoral student Uday Madaan entitled "*Caenorhabditis elegans* BMP transcriptional program implicates collagen remodeling in body size regulation."

## PSC-CUNY Research Award Recipients

PSC-CUNY Research Awards were received by:

**JOSÉ ANADÓN**
"Impact of urbanization on soil microbial communities"

**KARL FATH**
"Determination of the utility of a novel cell–permeant cathepsin L inhibitor in understanding cathepsin L function"

**NATHALIA HOLTZMAN**
"Defining the role of hemodynamic forces on cardiac morphogenesis"

**DAVID LAHTI**
"The ecology of cultural evolution: a test using bird song"

**ALICIA MELÉNDEZ**
"Role of recycling endosome RAB-10 in autophagy"

**JOHN WALDMAN**
"Anadromous fish restoration in East Coast rivers: Does scale matter?"

**JOHN WALDMAN** participated in the Dam Removal Workshop at Hofstra University, where he discussed "Diadromous fish restoration: Why it comes down to dams." He was the keynote speaker at Fish Passage 2016: International Conference on River Connectivity held at UMass Amherst. The topic of Dr. Waldman's talk was "Restoring Atlantic diadromous fishes: Why it comes down to dams (and why more dams should come down)."

Dr. Waldman was invited to speak on his book *Heartbeats in the Muck: The History, Sea Life, and Environment of New York Harbor* at the Hudson River Museum, Yonkers, NY, and at the Billion Oysters Project of the New York Harbor School, NY. He gave a talk on "Impact evaluation of projected DO deficits in the NY–NJ harbor estuary" at the New York–New Jersey Harbor Estuary Program Water Quality Subcommittee in New York. He also spoke on his book *Running Silver* in the Public Lecture Series of the Cary Institute for Ecosystem Studies in Millbrook, NY.

**ZAHRA ZAKERI** was co-organizer of the International Cell Death Society meeting on "Cell death and its translational ramification" held in Cork, Ireland. She also serves on the Advisory Board of the "Autophagy and Cell Death" section of the journal *Oncotarget* (http://www.impactjournals.com/oncotarget/index.php?journal=oncotarget).

# FACULTY SCHOLARSHIP 2016

D = Doctoral student M = Master's student U = Undergraduate student

## BOOKS

**Chabora, Peter C.** 2016. *Biology I and II: Laboratory Explorations. A Laboratory and Lecture Synthesis.* 2nd Edition. Hayden-McNeil, MacMillan, Plymouth, MI. Pp. 570. ISBN 978-0-7380-7807-6

Sanderson, E.W., W.E. Solecki, **J.R. Waldman,** and A.S. Parris, Editors, 2016. *Prospects for Resilience: Insights from New York City's Jamaica Bay.* Island Press, Washington, DC. Pp. 304. ISBN: 9781610917322

## BOOK CHAPTERS, REVIEW ARTICLES

**Greller, A.M.**, D.S.A. Wijesundara, and A.H.M. Jayasuriya, 2016. Classification of Lower Montane Evergreen Forests in Southern India and Sri Lanka. In *Vegetation Structure and Function at Multiple Spatial, Temporal and Conceptual Scales,* E.O. Box, Editor, Springer Publishing Co., New York. Pp. 169–213.

Palmisano,[D] N. J. and **A. Meléndez**, 2016. Detection of Autophagy in *Caenorhabditis elegans:* Introduction. In *Cell Death Techniques: A Laboratory Manual,* Ricky Johnstone and John Silke, Editors, Cold Spring Harbor Press, NY. Pp. 437–446.

Palmisano,[D] N. J. and **A. Meléndez**, 2016. Protocol 1: Detection of Autophagy in *Caenorhabditis elegans* Using GFP::LGG-1 as an Autophagy Marker. In *Cell Death Techniques: A Laboratory Manual*, Ricky Johnstone and John Silke, Editors, Cold Spring Harbor Press, NY. Pp. 447–453.

Palmisano,[D] N. J. and **A. Meléndez**, 2016. Protocol 2: Detecting Autophagy in *Caenorhabditis elegans* Embryos Using Markers of P Granule Degradation. In *Cell Death Techniques: A Laboratory Manual*, Ricky Johnstone and John Silke, Editors, Cold Spring Harbor Press, NY. Pp. 454-458.

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Palmisano,[D] N. J. and **A. Meléndez**, 2016. Protocol 4: RNAi-Mediated Inactivation of Autophagy Genes in *Caenorhabditis elegans.* In *Cell Death Techniques: A Laboratory Manual*, Ricky Johnstone and John Silke, Editors, Cold Spring Harbor Press, NY. Pp. 468–475.

Michels, H.T. and **C.A. Michels**, 2016. The new "old" weapon in the fight against infectious disease. *Current Trends Microbiology* 10: 23–45.

Branco, B. and **J.R. Waldman**, 2016. Resilience practice in urban watersheds. In *Prospects for Resilience: Insights from New York City's Jamaica Bay*, E.W. Sanderson, W.D. Solecki, **J.R. Waldman**, and A.S. Parris, Editors, Island Press, Washington, DC. Pp. 21-42.

Handel, S.N., J. Marra, C.M.K. Kaunzinger, V. Monica Bricelj, J. Burger, R.L. Burke, M. Camhi, C.P. Colon, O.P. Jensen, J. LaBelle, H.C. Rosenbaum, E.W. Sanderson, M.D. Schlesinger, **J.R. Waldman**, and C.B. Zarnoch, 2016. Ecology of Jamaica Bay: history, status, and resilience. In *Prospects for Resilience: Insights from New York City's Jamaica Bay*, E.W. Sanderson, W.D. Solecki, **J.R. Waldman**, and A.S. Parris, Editors, Island Press, Washington, DC. Pp. 91–116.

## PEER-REVIEWED PUBLICATIONS

**Freilich, X., J.D. Anadón**, J. Bukala, O. Calderon, R. Chakraborty, and S. Boissinot, 2016. Comparative phylogeography of Ethiopian anurans: impact of the Great Rift Valley and Pleistocene climate change. *BMC Evolutionary Biology* 16(1): 206.

Rodríguez-Caro, R.C., M. Lima, **J.D. Anadón**, E. Graciá, and A. Giménez, 2016. Density dependence, climate and fires determine population fluctuations of the spur-thighed tortoise *Testudo graeca. Journal of Zoology* 300(4): 265–273.

**Dennehy, J.J.**, 2016. Evolutionary ecology of virus emergence. *Annals of the New York Academy of Sciences: The Year in Evolutionary Biology* 1387: 1–23.

Esposito,[M] L.A., S. Gupta,[U] A. Prasad,[U] F. Streiter,[U] and **J.J. Dennehy**, 2016. Evolutionary interpretations of mycobacteriophage biodiversity and host-range through the analysis of codon usage bias. *Microbial Genomics* 2: doi: 10.1099/mgen.0.000079.

Ahmadi,[D] M., M.A.K. Torshizi, S. Rahimi, and **J.J. Dennehy**, 2016. Prophylactic bacteriophage administration more effective than post-infection administration in reducing *Salmonella enteritidis* shedding in quails. *Frontiers in Microbiology* 7: 1253. doi:10.3389/fmicb.2016.01253

Conway, J.E., **J.J. Dennehy**, and A. Singh, 2016. Optimizing phage λ survival in a changing environment: stochastic model predictions. *IEEE Conference on Decision and Control, Las Vegas, NV*. doi: 10.1109/CDC.2016.7799174.

**Holtzman, N.G.**, M.K. Iovine, J.O. Liang, and J. Morris, 2016. Learning to fish with genetics: a primer on the vertebrate model *Danio rerio.* Genetics 203(3): 1069-1089.

Pavel, M.A., C. Lv, C. Ng, L. Yang, P. Kashyap, C. Lam, V. Valentino, H. Fung, T. Campbell, S.G. Moller, D. Zenisek, **N. G. Holtzman**, and Y. Yu, 2016. Function and regulation of TRPP2 ion channel revealed by a gain-of-function mutation. *Proc. Natl. Acad. Sci.*113: E2363–2372.

Prabhudesai, S., F.Z. Bensabeur, R. Abdullah, I. Basak, S. Baez, G. Alves, **N.G. Holtzman**, J.P. Larsen, and S.G. Møller, 2016. LRRK2 knockdown in zebrafish causes developmental defects, neuronal loss, and synuclein aggregation. *Journal of Neuroscience Research* 94(8): 717–735.

Stein, L.Y. and **M.G. Klotz**, 2016. The Nitrogen Cycle. *Current Biology* 26: R94–98.

Kozlowski, J.A., M. Stieglmeier, C. Schleper, **M.G. Klotz**, and L.Y. Stein, 2016. Pathways and key intermediates required for

*continued on page 12*

## FACULTY SCHOLARSHIP 2015

D = Doctoral student
M = Master's student
U = Undergraduate student

*continued from page 11*

obligate aerobic ammonia-dependent chemolithotrophy in bacteria and *Thaumarchaeota*. *ISME Journal* 10: 1836–1845. doi:10.1038/ismej.2016.2

Podos, J., D. L. Moseley, S.E. Goodwin, J. McClure, B.N. Taft, A.V.H. Strauss, C. Rega-Brodsky, and **D.C. Lahti**, 2016. A fine-scale, broadly-applicable index of vocal performance: frequency excursion. *Animal Behaviour* 116: 203–212.

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Klionsky, D.J. *et al.* (**A. Meléndez**, among 2,465 other authors), 2016. Guidelines for the use and interpretation of assays for monitoring autophagy (3rd Edition). *Autophagy* 12(1): 1–222.

**Waldman, J.**, K.A. Wilson, M. Mather, and N.P. Snyder, 2016. A resilience approach can improve anadromous fish restoration. *Fisheries* 41: 116–126.

Klionsky, D.J. *et al.* (**Z. Zakeri**, among 2,465 other authors), 2016. Guidelines for the use and interpretation of assays for monitoring autophagy (3rd Edition). *Autophagy* 12(1): 1–222.

Datan,U E., S.G. Roy, G. Germain, N. Zali, J.E. McLean,D G. Golshan, S. Harbajan, R.A. Lockshin, and **Z. Zakeri**, 2016. Dengue-induced autophagy, virus replication and protection from cell death require ER stress (PERK) pathway activation. *Cell Death and Disease* 7: e2127. Doi:10.1038/cddis.2015.409

## QUEENS COLLEGE COMMENCEMENT 2016

**President Félix Matos Rodríguez addresses the graduates and their families.**

**Happy and grateful graduates celebrate their accomplishments.**

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**Darwin Prize**—Eun Jung Shin and George Titomihelakis
**Muriel and Philip Feigelson Award**—Anna McPherran
**Donald E. Lancefield Award**—Hanna B. Garber and Nicole A. Segal

## LIST OF GRADUATES

HH—with High Honors; H—with Honors; ΦBK—Phi Beta Kappa, the national honor society; BΔΦ—Beta Delta Phi, the national Biology Honor Society

Pankaj Aggarwal
Mostaque Ahmed
Syeda Ali
Alon Aminov
Sarah Aminov—H
Liana Aslanyan—H
Daniel Avezov—H
Raihana Azad—H
Kadlif-Rashid Bactowal
Navdeep Bains—H
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Annan Singh
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### Master's Degree Recipients

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In fiscal year 2016, **45** of our alumni donated **$8,182.50.** We are pleased to see the names of many who have faithfully donated in past years as well as several new names.

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